NOAA FISHERIES
NATIONAL MARINE FISHERIES SERVICE

Authorizations and Permits for Protected Species (APPS)

File #: 17312
Title: Study of Marine Mammal Use of Sound and Respo

Applicant Information

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Project Information

File Number: 17312

Application Status: **Application Complete**

Project Title: Study of Marine Mammal Use of Sound and Response to Anthropogenic Impacts

Project Status: Renewal

Previous Federal or State Permit: 727-1915

Permit Requested:
- MMPA/ESA Research/Enhancement permit

Where will activities occur?
California (including offshore waters)
US Locations including offshore waters
Oregon (including Columbia River and offshore waters)
Washington (including Columbia River and offshore waters)

Research Timeframe: **Start:** 09/11/2013 **End:** 09/13/2018

Sampling Season/Project Duration: Research would occur year-round.

Abstract:

This permit application covers scientific research activities to be conducted by the Scripps Institution of Oceanography and concerned with understanding cetacean use of sound and their sensitivity to anthropogenic sound as well as the impacts of the Deepwater Horizon oil spill. The applicant requests the authority to: (1) conduct photographic identification to determine the abundance, movements and population structure of cetaceans; (2) collect biopsies and fecal samples to determine taxonomy, sex, relatedness and stock structure of cetaceans; and (3) conduct non-invasive tagging to study cetacean diving behavior, calling behavior, feeding, and movements for 35 cetacean species/stocks. Studies will be conducted off the west coast of the U.S., in waters off Alaska, in the Gulf of Mexico and near Hawaii. Study sites will be locations where opportunistic anthropogenic acoustic sources and/or oil spill effects may be present to provide an opportunity to investigate possible impacts from sound and/or oil spill exposure.

Project Description

Purpose: The two primary objectives of this project are: (1) to develop improved methods for determining baseline data on cetaceans, and in particular how sound may be used to study cetacean behavior, and (2) to assess the potential effects of human impacts including anthropogenic sound and the Deepwater Horizon oil spill on cetacean behavior.

This research will help to improve baseline information on marine mammal status, abundance, stock structure, life history, seasonal distribution, and behavior, including acoustic communication. This will be accomplished by conducting simultaneous visual and acoustic surveys for marine mammals using ships and small vessels as well as deployed acoustic instruments. The data collected during these surveys will be used to develop methods incorporating both visual and acoustic data, and will help to identify important geographic areas and seasonal trends for marine mammal abundance. A key aspect of this work will be to develop, test, and validate models to characterize and predict areas of high and low importance for marine mammal habitat, including the ambient sound field and/or oil dispersion as a component of the marine habitat. By combining both visual observations and acoustic tag data the project will better understand marine mammal physiology, ecology, and behavior with particular emphasis on marine mammal diving physiology and sound production.

This project also will help to better understand and predict the occurrence and consequences of marine mammal behavioral responses to anthropogenic impacts from sound exposure and the DWH oil spill (including tolerance, habituation, sensitization, disturbance, and habitat avoidance or abandonment), and the relationship of these responses to physiological effects. Tracking and tagging technology will be used to elucidate the effects of anthropogenic sound and the DWH oil spill on marine mammals. By conducting simultaneous visual and acoustic observations, the project will collect data both on sound exposure (received levels at the animal from acoustic tag data) and on behavioral reaction to the sound. These data may allow better understanding of auditory and behavioral effects. A key long-term goal of this project will be to develop models to characterize the biological significance of anthropogenic sound and oil exposure.

Anthropogenic Sound

We propose to address our objectives on the effects of sound by observing cetaceans in the presence of opportunistic anthropogenic sound sources – those already present in the marine environment and not under the control of the project investigators. We choose this approach because these existing ocean sound sources are the most likely to have broad-scale effects on marine mammals, and because they will provide the best opportunity for collecting a statistically significant sample of events. In some cases (e.g. commercial shipping) using opportunistic sources may be the only practical way to collect data on marine mammal reactions to sound, as controlled cooperative field operations with these sources may not be practical.

The Channel Islands region off the southern California coast is one example of an area where a highly concentrated and diverse community of marine mammals is present within or adjacent to one of the world's busiest areas for shipping. The commercial ships passing through the Santa Barbara channel increase ambient noise levels by at least 20-40 dB on average, in an area that is a primary feeding grounds for several marine mammal species. For the last four years, we have studied the reactions of individual animals to individual ships, and also the overall habitat preferences of animal populations with respect to ambient sound levels (McKenna 2011)

An important aspect of our project design is the choice of a broad range of cetacean species. This results from the need for more information on all cetacean species' use of sound; in no case do we have adequate understanding of the full range of behavioral contexts involving sound usage. In addition, by selecting to study opportunistic sound sources, we will need to maintain flexibility in species selection. We will seek instances where the reaction can be discerned of individual animals to individual opportunistic sound sources (such as an approaching commercial ship). To accommodate this we have requested low take levels for a very broad range of cetacean species that we expect to be present in the study area.

Deepwater Horizon Oil Spill

This proposed research is critical to evaluating the short and long-term effects of the Deep Water Horizon oil spill incident. It is likely that the population level impacts of the event will evolve over an extended period of time; if changes in population demographics and/or calf production associated with reduction in habitat quality and/or chronic accumulation of toxic pollutants occur, these effects may take several years to become apparent. Similarly, if the ecosystem recovers relatively quickly, then it is possible that any changes will be transient, and it is important the monitoring program be conducted over broad enough spatial and temporal scales to evaluate these changes. We are currently collaborating with colleagues at SEFSC including Keith Mullin, Lance Garrison and Melissa Soldevilla as well as the Ocean Alliance including John Weise to undertake a long-term monitoring plan over a 5-10 year period. All field survey planning is reviewed and discussed with our collaborators to allow for optimal spatial and temporal coverage of the region as well as to limit any overlap in sampling. In most cases, our team works directly with SEFSC and/or Ocean Alliance to collect data in the Gulf via NOAA ships and the R/V Odyssey. Our collaborative work with the SEFSC and the Ocean Alliance includes conducting and analyzing data from ship-based visual and acoustic surveys, the collection and sharing of data from PAM systems, and coordinated efforts to collect biopsy samples from a broad range of species. The ability to interpret these long-term data will be greatly enhanced by the work proposed under this permit and our collaborative efforts with NMFS SEFSC and the Ocean Alliance.

This research will allow for an assessment of potential changes in animal distribution and/or behavior that may be correlated to oil exposure. Visual and towed acoustic array surveys will quantify the presence and spatial distribution of marine mammals within the spill area and adjacent regions. Data will be collected on vocal behavior for a broad range of species, and these data will aid in the interpretation of long-term acoustic monitoring data. Fixed autonomous passive acoustic recorders will be used to document changes in the occurrences and distributions of acoustically active whales and dolphins at selected sites including areas both close to and further away from the DWH event. Acoustic recording will provide data on the occurrences of a broad suite of species, including sperm whale, Bryde's whale, beaked whales and delphinids. Passive acoustic recordings will provide quantitative measures of species-specific occurrence over an extended period of time, where the regions sampled includes the high impact area near the incident site and areas several hundreds of miles distant. One of the goals of the program's integrated data analyses is to look for indications that spatio-temporal changes in species-specific detection rates are correlated with spatio-temporal changes in oil distribution.

Genetic analysis of skin from biopsy samples will be used to investigate population and/or stock related questions including potential correlates between stock identity and the physical structure of vocalizations, the gender of sampled animals and the sex-ratio of a given population. In addition, if sample sizes of 25 or more biopsies from a given species in the Gulf of Mexico are collected, both contaminant and hormone analysis may be also conducted.

Recent studies have shown that reproductive hormones can be measured from the blubber of cetaceans (Mansour et al., 2002; Kellar et al., 2006; Kellar et al., 2009). Blubber progesterone level is a robust indicator of pregnancy in these samples due to the 20-60 fold mean difference in concentration between pregnant and non-pregnant females; a finding that is consistent across a wide range of cetacean taxa (Trego and Kellar, 2009). Of 426 blubber samples taken from female cetaceans of known pregnancy state (representing 9 species), all (100%) were correctly classified based on blubber progesterone concentrations. The accuracy of this technique is due to the fact that there has been no observed overlap in blubber progesterone levels between pregnancy states; for example, an analysis of 206 female common dolphins found a 4-fold difference between the highest levels seen in non-pregnant females and lowest levels seen in pregnant ones (Kellar et al., 2006; Trego and Kellar, 2009). In addition to progesterone, there is emerging evidence that other steroid hormones such as testosterone (Kellar et al., 2009) and cortisol can also be quantified from blubber.

Cortisol is of particular interest given that it is one of the two primary glucocorticoids produced by the adrenals of mammals. Glucocorticoids are the most widely used indicators of physiological stress in mammalian systems (Reeder and Kramer, 2005), and they have been measured in cetaceans as a diagnostic of stress response (Thomson and Geraci, 1986; Staubin and Geraci, 1989; Suzuki et al., 1998; Ortiz and Worthy, 2000), predominantly from blood samples. However, stress studies are often constrained because the act of sampling (i.e., collection of blood) itself can elicit a response that elevates glucocorticoid concentrations such that it is difficult to discern whether the stressor of interest or the sampling event is responsible (Romero, 2002). The dynamics of blubber composition are much less rapid than changes in blood, such that the hormone signals within blubber represent longer windows of physiological time and are not heavily influenced by the events that take place in the minutes immediately prior to sampling (Kellar et al. 2006). Currently, methods of blubber cortisol measurements have been developed and are being validated on several species of cetacean, and at the very least the measurements appear to comprise a consistent index of relative cortisol production (Nick Kellar, SWFSC, Unpublished data).

The collaboration between SIO and SWFSC on the Southern California monitoring projects led to the incorporation of a recent and developing technique for assessing stress in free-ranging cetaceans. Bottlenose dolphin biopsy samples collected from October 2008 through July 2011 at San Clemente and Catalina Island, as well as off the San Diego coastline, are currently being analyzed by Nick Kellar and colleagues at SWFSC for glucocorticoids (GC) concentrations.

As part of the GC analysis, validation of the protocols used to measure cortisol in cetacean blubber is being conducted, by using bowhead whales (killed by native hunters in Alaska) as voucher specimens. Serum concentrations of cortisol are known for each of these whales and blubber cortisol levels have now been measured in 104 animals. The mean (SE) measured blubber cortisol value was 536 (± 86.8) pg/g and a significant relationship between blubber and serum cortisol levels ($R2 = 0.2245$ ($p = 0.035$). Though significant, the relationship is fairly loose; a result that was expected given what is known about the dynamics of blubber cortisol production. The serum levels are quite variable as they are integrated over a short period of time and the events just prior to sampling dominate the levels we measure. Blubber cortisol values are integrated over a longer period of time and therefore the act of sampling itself is much less likely to affect the measured value. Given that these bowhead whales were hunted and killed before being sampled, it is not surprising that the levels were higher in the blood and that the relationship between the two matrices is loosely correlated.

To determine contaminant (DDT, PCBs and PBDEs) levels, standard protocols developed by the Northwest Fisheries Science Center will be followed. Biopsy samples collected from coastal and offshore bottlenose dolphins in Southern California by SIO in collaboration with Dave Weller at SWFSC were recently analyzed for contaminant loads by Gina Ylitalo at NWFSC and further assessed by Nathan Dodder and colleagues at SCCWRP. We plan to utilize these resources for contaminant analysis of samples from the Gulf of Mexico and other regions where there is an interest in better assessing both regional and large scale variations in contaminant loads.

The target ESA-listed species are important for inclusion in our study of noise impacts, as they are among the marine mammal species most likely to be affected by low and mid-frequency noise, since they depend upon low and mid-frequency sound for communication and potentially other life-functions. Excluding these species from our study would forgo the potential for better understanding noise impacts on the portion of the marine mammal

community most likely to be effected by sources of anthropogenic noise. Use of alternate (non-ESA listed) species would not reveal the specific sensitivities of the above species to ambient noise, especially in the low-frequency band.

Expected research results on species listed as endangered under the ESA or listed as depleted under the MMPA will fulfill important research needs for these species. For blue, fin, humpback and sperm whales, the photo-ID work we propose here provides information on population size and trends in the North Pacific. Biopsies will be used to determine taxonomy, sex, relatedness, stock structure as well as reproductive and stress hormone levels, and will be correlated to call type when vocalizations are recorded from the whale (McDonald et al. 2006b). Tagging and acoustic recording work is focused on understanding the potential impacts of human-produced sounds on these species.

The proposed research responds to recommendations from several National Research Council studies (NRC 1994, 2000, 2003, 2005), as well as more recent efforts to examine the role of shipping noise on marine mammals (Southall 2005) and sonar on beaked whales (Cox et al. 2006). The National Research Council's Population Consequences of Acoustic Disturbance (PCAD) model (NRC 2005) describes the data required to evaluate biologically significant impacts of sound on marine mammal populations. The PCAD model includes five levels of variables that are related by four transfer functions. This proposal addresses the first three levels of the PCAD model: characteristics of the sound, behavior change of the animal, and life functions affected by the sound. For instance, we propose to evaluate how increasing noise generated from commercial shipping may affect foraging or social behavior, mask acoustic signals produced by the whales, or cause changes in vocal behavior in response to increased noise (i.e. Lombard effect). Our research may contribute to conservation of the marine mammal species under study by providing data on potential impacts due to anthropogenic sound.

Background Information

Anthropogenic Sound

There is growing concern that sound introduced into the sea by human activities has detrimental effects on marine mammals (see Hildebrand 2005 for a review). Evidence suggests that high-intensity anthropogenic sound from military sonar has resulted in stranding and subsequent mortality of beaked whales (Cox et al. 2006). Although the mechanisms of injury in these events are unclear, the species affected and implicated sound levels follow a consistent pattern. A more pervasive, yet subtle, problem may be the effects of increases in ocean background noise levels (McDonald et al. 2006a). Contributors to ocean noise include commercial shipping, defense-related activities, hydrocarbon exploration and development, research, and recreation. Higher levels of background noise may interfere with marine mammals' ability to detect sounds, whether these are calls of members of their own species, echoes from prey, or natural sounds that aid in navigation or foraging. Elevated noise levels may affect developmental, reproductive, or immune functions and cause more generalized stress. The effects of other pollutants (e.g., chemicals) may be additive or synergistic with those of noise. Likewise, noise may have ecosystem scale effects, including impacts to marine mammal prey.

Sound is an extremely efficient way to propagate energy through the ocean, and marine mammals have evolved to exploit its potential. Marine mammals rely on sound to locate prey, communicate, and avoid predators. Toothed whales have developed sophisticated echolocation systems to sense and track the presence of prey and engage in complex exchanges of vocalizations with members of their own species. Baleen whales have developed long-range acoustic communication systems to facilitate mating and social interaction. Some baleen whales produce intricately patterned songs that continue for hours or days. Marine mammals may use sound from natural sources as a guide for navigation, prey detection, and avoidance of predation. The sound environment of the ocean is an important aspect of marine mammal habitat and we can expect marine mammals to choose their locations and modify their behavior based, in part, on natural and anthropogenic sounds.

The ocean is also vital to humans as a source of food and energy, path for commerce, and site of military action. All these human activities create sounds within the water, and potentially create a conflict between human and marine mammal use of the sea. As human use of the ocean has increased in recent decades, so too have associated noise levels. Just as we have come to realize that humans are affected by noise, it is clear that marine mammals with their greater reliance on sound are likely to be affected by noise.

We are in the early stages of understanding the nature and extent of the problems surrounding anthropogenic sound in the ocean and its effect on marine mammals. Efforts to date have largely focused on characterizing the problem. The National Research Council Ocean Studies Board of the National Academy of Sciences has conducted four studies on this topic (NRC 1994, 2000, 2003, 2005). In addition, more recent studies have examined the role of anthropogenic sound in beaked whale stranding (Cox et al. 2006). These reports contain excellent analyses of available information, highlight various concerns, and point to the need for more specific information about the effects of noise on marine mammals.

A major impediment to assessment of the biological effects of ocean noise is the lack of knowledge about marine mammal responses to sound. Behavioral data are needed to examine those responses so that effects can be assessed. Significant effects may be confined to a few individuals exposed at high sound pressure levels, or may be occurring at a population level as a result of widespread exposure. Discerning population-level effects is

challenging since the observations must be conducted over great distances and long time periods. Although much has been learned about the effects of noise on marine mammals (Richardson et al. 1995), available information is not sufficient to assess in detail how anthropogenic sound may be affecting marine mammals and other components of marine ecosystems.

The permit activities proposed focus on the impact of anthropogenic sound on whales and dolphins. Ongoing studies by the applicant are collecting large data sets (2 Terabytes per deployment) of broadband (10 Hz to 100 kHz) passive acoustic recordings in which echolocation and call behavior for a large number of cetaceans have been observed at fixed locations for a year or more. In the case of echolocating species, these passive recordings allow monitoring of feeding times, observations of diel patterns in feeding and possible disruptions of feeding due to anthropogenic sound. Some of the observed echolocation signals have never been correlated as to species, even though the character of many of these signals is often very distinct and consistent for a given group of animals.

High frequency commercial shipping noise (McKenna et al. 2012) is a topic of increasing interest with regard to the possible impact on echo locating odontocetes. Disruption of normal feeding activity may be caused by passage of a merchant vessel as suggested by Soto et al. (2006). High frequency (greater than 10 kHz) ship cavitation noise can be modeled, as causing a predictable decrease in prey detection echolocation range for the animals (Au et al. 2004; unpublished data).

Previous research by the applicant has considered noise disturbance of baleen whales (McDonald et al. 1995; McDonald et al. 2006; Melcon et al. 2012), but the stranding of beaked whales in association with sonar operations is driving new areas of research with a focus on smaller odontocetes (Cox et al. 2006).

Deepwater Horizon Oil Spill

The Deepwater Horizon incident at the Mississippi Canyon 252 (MC252) site resulted in the discharge of an extensive oil spill within a region of high density and diversity of marine mammals. Aerial surveys conducted in this area have documented the presence of sperm whales, pantropical spotted dolphins, striped dolphins, spinner dolphins, bottlenose dolphins, Risso's dolphins, and Cuvier's beaked whales within or near the oil spill (SEFSC, unpublished data). Sperm whales inhabiting the Northern Gulf of Mexico include the area near the MC252 incident within their home-ranges, and the areas of the Mississippi Canyon and DeSoto Canyon are known areas of high density for sperm whales along with other oceanic marine mammals (Jochens et al. 2008). In addition, a small, isolated population of Bryde's whales resides along the continental shelf break just east of the spill area (Waring et al. 2010) and is the only known resident baleen whale in the Northern Gulf of Mexico.

The effects of oil on marine mammals are not well understood. However, it is probable that sperm whales and other protected marine mammals encountering oiled environments experience potential detrimental effects due to skin contact, inhalation of hydrocarbon vapors, and ingestion of oil (Geraci 1990). It is unknown whether or not prolonged exposure would result in direct mortality of individual animals. The area near the spill is a high-use habitat for many species, and this is likely associated with concentration of prey resources. The primary prey of sperm whales and other deep-diving marine mammals is thought to be deepwater squids. High levels of subsurface oil from the incident are likely to have significant direct impacts on this prey community through potential toxic effects due to oil contaminants in the water column. It may be that a direct effect of severe habitat degradation related to the spill will be a shift in spatial distribution by these highly mobile predators resulting in the movement of animals out of a primary feeding habitat to areas with lower prey densities. A distribution shift may have impacts on survival and productivity of the populations. It is also likely that the marine mammal populations of the northern Gulf of Mexico will be exposed to chronic impacts of the spill due to increased concentrations of contaminants or toxins in the food web.

In addition to the oil released at the well site, several hundred thousand gallons of oil dispersant chemicals have been deployed within the spill region. The composition and toxic effects of the dispersants are unknown, and their impacts on marine mammals within the spill area are uncertain. As with the oil impacts, the probable impacts of chemical dispersants on marin%20leavePage('../project/project_description.cfm?ProjectID=17312&RecType=Project&RecordID=17312',%20false,%20false,'Save');e mammals include acute exposure due to contact or inhalation, shift in distribution away from a primary feeding habitat, and/or longer-term exposure through accumulation in the food web.

Ongoing studies by the applicant are collecting large data sets (10 Terabytes per deployment) of broadband (10 Hz to 100 kHz) passive acoustic recordings in which sperm whale, dolphin and baleen whale call behavior have been documented since May 2010. In the case of echolocating species such as sperm whales and delphinids, these passive recordings allow monitoring of feeding times, observations of diel patterns in feeding and possible disruptions of feeding due to anthropogenic impacts such as the oil spill. Some of the observed marine mammal calls have yet to be correlated to species, even though the character of these signals is may be distinct and consistent for a given group of animals.

Research Summary 2008-2013

During the period from 2008-2013 under Permit No. 727-1915, long-term photo-identification research and biopsy sampling were utilized to assess the population structure of multiple cetacean species. The

photo-identification component of our field program was successful with samples collected from 10 odontocete and 4 mysticete species. All photo-identification data are currently being analyzed at SIO and/or integrated into existing catalogs maintained by our collaborators. Biopsy samples were collected from 5 delphinid and 2 mysticete species with tissues currently being assessed for contaminant loads, hormone levels and DNA structure. These data will allow us to evaluate population structure of regional species, particularly those that may have inshore versus offshore or island-associated populations and are therefore subject to different environmental and human related pressures. In addition, comparisons of contaminant loads and hormone levels from animals distributed in "low-impact" versus "high-impact" regions will elucidate how anthropogenic pressures manifest themselves within the physiological systems of cetaceans. The tagging component of our research is currently being developed for field application during 2013. (See attached file for more details.)

Description: This research is part of a long term study by the applicant to associate acoustic recordings with cetacean species, stocks, and individuals and to examine response behavior to anthropogenic impacts including sound and the Deep Water Horizon oil spill. Data collected may also be used to examine movements, population structure, abundance and trends in populations. Proposed research off the west coast and in the Hawaiian Islands region is a continuation of work that has been carried out since 2008 and, due to the long-term nature of our studies; we expect this work to continue through at least 2018. The Alaska and Gulf of Mexico regions represent new focus areas for our work and we expect that this research will be carried out over a five-year period beginning October 1, 2013 and continuing until August 30, 2018. Our on-going acoustic studies of marine mammals are conducted year-round, and we hope to conduct the field work described in this permit on a year-round basis.

LOCATIONS

The locations for the research will be in the North Eastern Pacific off the west coast, in the North Pacific off Alaska, in the Central Pacific off Hawaii as well as regional islands, and in the Gulf of Mexico. We currently have active study areas for acoustic recording off the Washington coast, off Alaska, off southern California (south of Point Conception), at Hawaii and Pearl and Hermes reef, Wake Island, Saipan and in the Gulf of Mexico.

Our west coast study area stretches from the Canadian to the Mexican border and as much as 200 nautical miles offshore. A primary location for this research will be the southern California Bight, in an area where anthropogenic sounds are created by sonar usage and by commercial shipping. Our study will take place within the Channel Island National Marine Sanctuary (CINMS) and the Santa Barbara Channel, one of the primary access routes for ships headed into one of the world's largest ports at Los Angeles and Long Beach. We propose to conduct studies in the CINMS in collaboration with sanctuary staff, and the results of our study should help to define the noise field present within sanctuary waters and the potential for noise to impact CINMS marine mammals. We have received ship support for this work from the CINMS and plan to conduct the work year-round. Another active area for acoustic recording is in the Olympic Coast National Marine Sanctuary, and we propose to conduct some of the work described in this permit application in this area. We also plan to work in the Monterey Bay, Farallones, Cordell Bank, and Hawaiian Island Humpback Whale National Marine Sanctuaries. These areas have significant marine mammal populations and exposure to commercial shipping.

Our Alaskan study area encompasses the northern Gulf of Alaska, western Aleutian Islands, Bering Sea and the Arctic; these regions have been monitored using passive acoustics for 2 or more years. During field operations associated with the recovery and re-deployment of HARP recorders, we plan to integrate small boat operations to collect additional information from species associated with acoustical recordings.

Our Central Pacific study area encompasses the main Hawaiian Islands and offshore areas (up to 200 n miles offshore), as well as the regions surrounding Pearl and Hermes reef, Wake Island, Saipan, Guam, Palmyra Atoll and American Samoa. We do not plan to work in areas of Hawaiian Monk Seal critical habitat near the North West Hawaiian Islands, as these areas are in shallow water (< 20 fathoms) which is generally not appropriate for our study owing to poor acoustic propagation.

Our Gulf of Mexico study area encompasses four primary operational areas. These areas include regions where sperm whale and other oceanic marine mammal densities are high during summer months based upon historical survey data. The areas include: (A) The shelf break region south of Louisiana, (B) The De Soto/Mississippi Canyon Area, (C) The Dry Tortugas, and (D) Bryde's whale habitat in the north-eastern Gulf of Mexico. The home ranges of sperm whales within the northern Gulf of Mexico are likely to include primarily areas A and B. The Dry Tortugas region is also an area of known concentration of sperm whales, and it is unknown if these animals also occupy the other regions of the Northern Gulf. The Dry Tortugas region is selected as a control site given that it has not experienced significant impacts from the DWH oil spill incident as of yet. The vessel will transit to each operational area on an adaptive basis dependent upon weather and other conditions and conduct major science operation within the area.

Weather considerations will dictate work in the summer and fall in many of the study areas, although work in other seasons will be attempted when the weather permits. We do not plan to conduct surveys in areas of designated critical habitat for North Pacific right whales in the Bering Sea; our request for a small number of takes from the North Pacific right whale population is based on the remote chance that we encounter members of this population during field surveys in other regional locations.

TAKES

The take table gives the approximate months we expect to encounter each species that we will study. When available we will use an oceanographic research vessel as a support ship, and launch small boats from the larger vessel for detailed photo-identification, biopsy and tagging studies. The larger vessel will allow us to study offshore regions, and more efficiently conduct tagging studies (e.g. able to remain with tagged animals during

darkness). Field work will be conducted year-round, but timed to coincide with relatively calm weather when possible.

For most species listed in the take table, we have incorporated a "range-wide" designation, allowing for individuals from any of the designated stocks to be sampled. This method best accommodates the large spatial scale in which we conduct our research operations. The four exceptions to this range-wide approach are California coastal stock of bottlenose dolphins, the CA/OR/WA stock of bottlenose dolphins, the southern resident stock of killer whales, and the Hawaii insular stock of false killer whales. The California coastal and CA/OR/WA stocks of bottlenose dolphins are currently the focus of a long-term, extensive monitoring project by our lab in direct collaboration with Dave Weller and colleagues at SWFSC. Given our frequent and intensive sampling of these two stocks, it was deemed necessary to request an independent set of takes for these stocks versus a range wide approach. The southern resident killer whale and Hawaii insular false killer whale stocks are endangered and currently the focus of several research projects. While we don't have any plans to focus research efforts on either of these two endangered stocks, we are requesting permission for a very limited number of takes for each in the case of an opportunistic encounter. Given the status and concern about these two stocks, we deemed it necessary to exclude them from the range wide designation to limit the number of takes if an opportunistic encounter were to occur.

The actual number of takes is expected to be less than the totals listed in the take table, but the listed numbers allow for study when opportunistic sound sources are present. Our goal for tagging is to obtain a minimum of 5-10 attachments per studied species, over the duration of the project. The actual number of tag attachments will depend upon animal availability, weather conditions, and the location of opportunistic sound sources. Takes by tagging will involve only suction cup tags. The total number of takes for each species will be distributed between all the study sites. Tagged and/or biopsied individuals will also be subject to photo-identification, so that more than one type of take may occur on the same individual.

METHODS

We will typically operate with both an oceanographic research vessel (e.g. R/V Robert G. Sproul shipsked.ucsd.edu/ships/sproul/index.html) and a small boat (e.g. RHIB rigid-hulled inflatable boat). The use of a research vessel allows this work to be conducted over several days during extended cruises, however, when the vessel is not available, we will also conduct this work during day trips using the small boat. The small boat will be used to approach animals for photo-identification, biopsy or tagging except in instances when animals are bow-riding or approach the vessel. The RHIB provides less disturbance of the animals and is a more maneuverable platform. The larger vessel generally will be kept at 100 m or greater distance from the animals to minimize disturbance. No photographs or other data collection will be undertaken from vessels participating in whale-watching activities under this permit.

Target animals will be approached by the small boat at a speed closely matching the animals' own rate of travel (e.g. 1 – 8 kts). Stationary animals will be approached at low speed (1- 2 kts). When possible the approach will be conducted gradually to minimize or avoid a startle response.

We expect to approach large whales to about 100 feet (30 m) to obtain identification quality photographs. Small cetaceans will be approached to a minimum distance of 30 feet (10 m), although when possible identification photographs will be taken from about 100 feet.

The approach methods will vary somewhat between large whales and small cetaceans. Large whale approach necessarily involves variable speed and direction changes, as the location for surfacing is less predictable. It is sometimes necessary to use short bursts of speed to make a final approach from behind after the whale is committed to surfacing. The whale's behavioral mode (traveling, milling) is important to determine the required speed of approach. The safety of the field party and the whale often determine the best (safest) boat driving speeds in the field. Small cetacean approach can be conducted more at a steady rate and direction. Since small cetaceans are often found in larger groups they present both more opportunities (more animals available) and complexities (how to target a single animal without disturbing many others) when approached. We will approach both large whales and small cetaceans from the side or from behind, so as not to interfere with their path of travel.

Sea otters, sea turtles, and other protected marine mammals that are not the focus of our study will be avoided to minimize the potential for incidental harassment. The large vessel will conduct a visual watch for these protected species, in addition to the target animals, and we will operate the vessel in a manner respectful of minimizing incidental harassment of these animals, such as maintaining greater than 300 ft (100 m) distance when possible. We will only approach specific target animals for photo identification, biopsy sampling or tagging. These target individuals will be carefully chosen to limit incidental harassment of non-target species.

Photo-identification:

All age and sex classes would be targeted for photo-id.

Photo-identification and vessel surveys will be used to relate visually determined abundance, distribution, and movements of whales to acoustically determined measures of abundance, distribution and movements. On-going

research conducted by the applicant has provided new information on movements and relative abundance of blue whales (McDonald et al. 1995; Burtenshaw et al. 2004; Sirovic et al. 2004; Wiggins et al. 2005) and fin whales (McDonald et al. 1995, Goldbogen et al. 2006) and examined the possible impacts of anthropogenic noise on cetaceans (McDonald et al. 1995; Hildebrand 2005) and increases in anthropogenic sound in the ocean (McDonald et al. 2006). Research conducted by the applicant has documented the sounds produced by individual whales of known species and sex to statistically evaluate the sounds expected from a given species and sex during specified behaviors (McDonald et al. 2001; Oleson et al. 2003; Oleson et al. 2007), with a goal of applying these data to quantify acoustic census methods.

Identification photographs will be made available to other researchers working with photo-id catalogs of the given species in a given geographic area. For example, Cascadia Research will be provided photographs of blue and humpback whales off the California coast. Cascadia Research compiles summaries of the number of unique whales seen by region and time period, movements of animals based on re-sightings of the same individual during a season, interchange rates based on inter-year re-sightings of animals among regions, and capture-recapture abundance estimates.

Photo-identifications will usually be conducted from small boats, although some will be undertaken from larger support vessels. The primary vessels we will employ in these dedicated photo-identification surveys will be 5.3-5.9 m inflatable or rigid-hulled inflatable boats with outboard engines. We anticipate that about 80% of the takes from close approach will occur using these smaller vessels. We will also use larger support vessels, such as the R/V Robert Sproul an 84 gross ton 125' long oceanographic research vessel. We anticipate that about 20% of the takes from close approach will occur from these vessels.

Approaches typically will last from a few minutes up to an hour, depending on sea conditions, time of day, species encountered, behavior, and research goals. The animals will be approached close enough to optimize photographic quality. Distance for optimal approach varies with the species being photographed. Generally, large whales will be approached to a minimum of 30 m, and small cetaceans to a minimum of 10 m. Vessel approaches will typically be done slowly and the vessel maneuvered from behind or the side of an animal or group of animals to minimize potential disturbance.

Identification photographs will be taken with digital SLR cameras equipped with telephoto lenses (200-400mm). For humpback whales, photographs will be taken of the ventral surface of the flukes. For blue and gray whales, the right and left sides of the animals' back the vicinity of the dorsal fin or hump will be photographed; flukes will be photographed when possible. For beaked whales identification photos may be of either the scarring near the head or of the dorsal fin region.

Biopsy method:

We expect to biopsy and tag both sexes, but we do not propose to biopsy or tag mothers with calves less than one year old or their calves. Typically, each animal will only be biopsy sampled once during the life of the permit; however, in some cases (i.e. stress/reproductive hormone and/or contaminant studies), the experimental design may call for one biopsy sample to be collected from the same individual once per year to allow for long-term monitoring of potential changes in hormone and/or contaminant loads.

The objectives for biopsy sampling will be 1) determine the sex of any tagged animal whose sex cannot be determined visually, 2) to sample individuals to whom acoustic recordings can be attributed in order to correlate sound production differences to possible stock differences, 3) to determine species for any animal which may have concurrent acoustic recordings, but for which visual identification of species is difficult, such as Mesoplodon perrini, and 4) to determine genetic relatedness as in a social group of beaked whales.

All genetic samples will be preserved according to the current best practices as recommended by Southwest Fisheries Science Center (SWFSC). Samples will be provided to one or more of our collaborators at SWFSC including Dave Weller, Nick Kellar, Aimee Lang and Gabriela Serra-Valente; the species sampled and analysis objectives will typically define whom at the SWFSC the sample is linked with. For example, we are currently involved with three bottlenose dolphin projects in direct collaboration with scientists SWFSC: 1) Levels of persistent organic pollutants in blubber of free-ranging bottlenose dolphins (Tursiops truncatus) off Southern California (Dave Weller), 2) Demographics of bottlenose dolphins in the SCB (Dave Weller or Aimee Lang), and 3) Monitoring bottlenose dolphins (Tursiops truncatus) stress and reproductive hormone levels relative to mid-frequency active sonar exposure at the SCORE range, San Clemente Island, California (Nick Kellar).

Preliminary work with broadband (10 Hz to 100 kHz) seafloor acoustic recorders and towed acoustic recording arrays is showing distinctive spectral structures within the echolocation sounds of many species of dolphins. If the combined visual and acoustic recording work shows more than one acoustic spectral structure from a visually identified species, it would be valuable to obtain genetic samples to look for stock or subspecies differences. The beaked whales are very poorly known acoustically and preliminary results from seafloor recorders show a number of echolocation sounds similar to known beaked whale sounds, but which do not match any species exactly. As our knowledge increases with regard to the geographic and species differences in beaked whale sounds it will be valuable to have genetic samples for comparison. Many of these beaked whale echolocation sounds have structure and characteristics as species specific as those of bats, where acoustic identification and acoustic surveying are commonly employed survey methods.

Biopsy darts will be fired from a crossbow at a range of 5-15 m, or in cases where close approach on large whales is not feasible (i.e. ship-based surveys), from a "Larsen" projectile system (Pallsbøll 2002) at a range of

50-100 m attempting to sample the flank near the dorsal fin or peduncle area. For large whales and mid-size cetaceans (e.g. pilot whales, Cuvier's beaked whale, Risso's dolphin) a biopsy dart is made up of a 40-mm-long, 6-mm-diameter cylindrical stainless steel punch fitted with barbs to hold a sample in place, attached to either the end of a standard crossbow bolt or the similar "Larsen" projectile (total weight is about 30 g for each type of projectile). A stopper set 2.5 to 4 cm back from the tip of the punch, causes the bolt to rebound and float on the surface of the water following impact with the target. The skin and blubber sample is removed and the tissue sample split for various analyses. The "Larsen" system has the advantage of improved accuracy and readily varied projectile velocity for long or short range use. The disadvantage of the "Larsen" system is increased complexity, making it a system better suited to use from a larger vessel where the longer ranges possible with the "Larsen" system make it safer to use in cases where vessel collision with animals may be a concern.

For small cetaceans (e.g. bottlenose dolphin, common dolphin, striped dolphin) a low-power cross-bow or pole is used to collect biopsy samples, with bow-riding animals sampled exclusively with a pole-based system. The crossbow method incorporates a shorter 25-mm-long and 6-mm-diameter cylindrical stainless steel punch fitted with barbs to hold a sample in place. A stopper is set 15 mm back from the tip of the punch. With the exception of the unusual death of a single Common dolphin (Delphinus delphis) (Bearzi 2000), reactions of various species of cetaceans to biopsy darting have generally been mild (Whitehead et al. 1990; Brown et al. 1991; Weinrich et al. 1991, 1992; Barrett-Lennard et al. 1996; Weller et al. 1997). The biopsy pole system utilizes a sterilized nylon scrubbing pad affixed to the tip of a modified wooden dowel designed to collect a small sample of epidermal cells from the back of bow riding dolphins (Harlin et al. 1999, Farro et al. 2008). When bowriding dolphins approach the surface of the water, skin samples are swabbed from their dorsal or lateral surfaces by quickly making contact between the sterile pad and skin. Simultaneous with pole-based sampling, photographs of distinctive natural markings such as scars on the dorsal side of the target animal will be acquired; after a sample from a target animal has been taken, digital images of that individual will be reviewed onboard the research vessel by the biopsier, photographer and boat driver to minimize the probability of resampling the same animal. No additional samples will be taken unless all members of the field team are confident that subsequent target animals have not been previously sampled. As an alternative to projectile based biopsy sampling regimes, this method provides a seemingly less invasive and lower risk alternative for collecting skin for subsequent DNA analysis. The pole system is specifically designed for acquiring small skin samples from bow riding individuals; thus, the closest approach would be approximately 2 meters for this type of sampling.

The resulting skin/blubber biopsy samples, sloughed skin or fecal samples collected from the water surface or water column, or skin samples collected off tag suction cups, will either be frozen or stored in compliance with the current best practices as recommended by SWFSC. Samples will be provided to one or more of our collaborators at SWFSC including Dave Weller, Nick Kellar and Gabriela Serra-Valente (see above for additional details). Samples collected opportunistically from non-target species are provided to the genetics collection curator, Gabriela Serra-Valente, with no restrictions on use for current or planned projects by SWFSC scientists..

The biopsy dart tips will be cleaned of all visible materials between sampling events. Cleaning will be a done by washing and immersion in a bleach or equivalent solution, reducing the risk of contamination. The tips will be sterilized with an ethanol solution or equivalent sterilizing technique.

The protocol is given below:

Procedure for cleaning biopsy tools, sampling heads (tips) and darts.
• Rinse Teflon coated tray with ethanol. This is your drying tray for cleaned and sanitized tools, tips and darts. Wash darts separately, (see below).
• Fill small/medium sized Rubbermaid container with hot water and soap, (use Alconox or Dawn. Both are very concentrated so you only need a little). Wash darts separately to lessen crowding.
• Place tips and dirty tools in the hot, soapy water.
• Scrub each item thoroughly. For tips use a bottle brush to get inside clean. Make sure all tissue/residue is removed completely.
• Soak in 10% bleach/water solution for 5 minutes. Be careful not to forget items in bleach as they will begin to degrade.
• Rinse in hot tap water.
• Rinse with lab grade bottled water or distilled water if lab water not available.
• Rinse each piece in ethanol.
• Place on Teflon coated tray to dry. Cover with large Kimwipe.
• When items are dry wrap tools with ethanol rinsed foil and place tips in small plastic Ziploc sample bags.

For Darts:
• Rinse in hot tap water.
• Scrub entire dart thoroughly with hot, soapy water. Pay particular attention to dart head area as tissue/residue will most likely be in this area.
• Soak in 10% bleach/water solution for 5 minutes. You will need a longer container for darts to soak in than other tools.
• Rinse with hot tap water.
• Rinse with lab grade water or distilled water if lab water not available.
• Rinse with ethanol.

• Place on Teflon coated tray to dry.
• Wrap dart heads in ethanol rinsed foil.

Fecal Sampling

We propose to collect fecal samples and sloughed skin samples on an opportunistic basis. A range of fecal-based studies have been developed to assess the reproductive status of individual whales, and to study factors affecting their health and fecundity. Fecal hormones have been used to determine reproductive status of right whales (Rolland et al., 2005). Concentrations of reproductive hormones revealed gender, pregnancy and lactation in females and sexual maturity in males. It is also possible to identify individuals by creating genetic profiles using DNA isolated from feces and measuring adrenal hormones to assess stress levels (Hunt et al., 2006). Fecal parasitology studies have revealed protozoa infection rates (Hughes-Hanks et al., 2005).

Floating whale scat or sloughed skin will be collected using a nylon dipnet. Fecal samples will be identified in the field by size, shape, color, and characteristic odor. Salt water will be drained off the feces, samples stored in polypropylene jars and placed on ice until frozen or otherwise stored. The date, time and position of collection will be recorded for each sample. The samples will be transferred to SWFSC for analysis, and be made available to other marine mammal researchers. When the sloughed skin or fecal sample can be associated with an individual, the whale will be photographed for subsequent photo-identification analysis.

The approach to collect whale fecal samples will be at 100 feet or more from the animal, and typically will be delayed until the animal has moved well away from the collection site. These samples will be collected opportunistically, during photo identification work as well as biopsy/tagging. No separate approach to collect fecal samples will be undertaken, and no additional close approaches will be needed.

Bioacoustic Tags

We propose to attach acoustic recording tags (e.g. Acousonde or B-Probe) by means of suction cups to measure the behavior of animals when anthropogenic noise sources are and are not present. Acoustic recording tags are constantly being improved upon, with new features being added, greater miniaturization, and greater recording capacity, thus the tags we will use may include new capabilities for sensing and data recording. The tags do not transmit the data and must be recovered to obtain all data except the tracking information data from VHF bearings and satellite fixes. The tags we have used in the past were designed and built by Bill Burgess of Greeneridge Sciences with attachment systems provided by Cetacean Research Technologies, similar to that described in Goldbogen et al. (2006).

The tags typically include:
1) VHF transmitter to track the whale during surfacing and for recovery of the tag after detachment
2) Hydrophone to record underwater calls, ambient noise, and anthropogenic noise exposure
3) Sensors to record water temperature and water depth
4) Sensors to record roll, pitch and compass bearing; these recordings provide fluke rate, buoyancy depth, feeding lunges, and an underwater track

Currently available commercial tags (Greeneridge Sciences Inc.) have electronic data-loggers that record pressure, temperature, and sound up to a maximum sample rate of 232 kHz. These tags are passive acoustic recorders and do not produce or emit any sound. They are made with solid-state electronics and have no internal moving parts (e.g. disk drive). The tag provides calibrated acoustic data with a frequency response between 10 and 116,000 Hz, with 16-bit resolution and a sensitivity of -190 dB re: 1 V/µPa. The VHF radio (Advanced Telemetry Systems, Isanti, MN) is integrated into the tag floatation and has a 30-cm flexible antenna. The VHF transmitters operate in the frequency range of 164-166 MHz and have transmitted power of less than 1 mWatt. Four circular silicon suction cups (designed by Cetacean Research Technology) are used to attach the tag. With flotation and suction cups, the tag is approximately 22 cm long and 6 cm in diameter and weighs approximately 360 g in air. The primary improvements we expect over past tags will be increased data capacity, broader band acoustic recording, and reduced size. Tag technology is expected to improve throughout the research period.

The potential impacts of suction-cup tags are similar to biopsy sampling, as the process involves close approach an attachment pole contacting the animal. Suction-cup attached tags elicit mild, low-level reactions and have proved to be effective for short-term deployments on larger species, including fin and blue whales (Giard 1996), gray whales (Malcolm et al., 1996), Hector's dolphins (Stone et al., 1994), beluga whales (Lerczak, Shelden & Hobbs, 2000), killer whales (Goodyear 1993, Baird 1994), beaked whales (Hooker et al. 2001) and long-finned pilot whales (Baird et al. 2002) but less effective with smaller odontocetes such as Dall's porpoise (Hanson and Baird 1998) and bottlenose dolphins (Schneider et al. 1998).

Medium to large sized cetaceans such as beaked whales and baleen whales will be approached from behind using a RHIB (rigid-hulled inflatable boat) to within ~2–8 m. Smaller cetaceans such as bottlenose and Pacific white-sided dolphins will be tagged while bowriding. The tag is attached to the whale using a custom designed pole. An attachment pole is used with a specially designed bracket to hold the tag in place yet allow it to detach from the pole after becoming attached to the whale. Once tagged, the whale will be photographed for individual ID. The tagged whale's position and behavior relative to the ship will be monitored at several hundred meters distance using reticle binoculars and GPS. Whale reaction to tagging is generally short-term with resumption of previous behavior within one dive cycle. Skin will be collected from the inner surface of the suction cup or tagging apparatus to allow for the evaluation of sex-based differences in behavioral reaction. Once detached, the tag is recovered with the aid of an embedded VHF transmitter. A tag boat and a support boat will be used for

tagging operations to ensure collection of all surface behavioral data, photo-ID of the tagged whale, ancillary acoustic recordings, and for tagging crew safety. Suction cup tag attachments on whales typically last several hours, though attachments lasting up to several days occur on perhaps ten percent of the attachments.

Pole attachment techniques will utilize a pole 3-8 meters in length, necessitating approach of ~2-8 meters to attach the tag. In an encounter to place a tag, each individual whale will be approached no more than three times. We will attempt to place the tags on the back of the whale mid-way between the blowhole and the dorsal fin. Because attachment is by suction-cup the tags will not penetrate the skin.

TRACKING and PASSIVE ACOUSTICS

When a tag is successfully attached, we will track the tagged animal using the small boat (if possible) or the larger support vessel. Suction cup tag attachments vary in duration from a few minutes to at most several days. The tag radio transmitter will be used to indicate when the animal is at the surface, and also the direction to the animal, using a directional radio antenna. During tracking we will maintain a distance of 100 m or more between the tracking vessel and the tagged animal. We would like to minimize the impact of the tracking vessel on the tagged whale, and we do not anticipate closely approaching and/or harassing the tagged animal while the tag is in place. After the tag detaches from the animal we will recover it with the tracking vessels, using the VHF radio signal as a guide.

Following tag attachment, a 2-7 element broadband (10 Hz–96 kHz) hydrophone array will be deployed when feasible from the support boat for several minutes. The array is a passive acoustic sensor and does not produce or emit any sound. The array elements are 1-3 meter in length, and can be deployed to a maximum distance of 300 m from the support vessel using a support cable. The array will generally be allowed to hang vertically (maximum depth 300 m), to provide a high-quality acoustic recording. This hydrophone array will provide calibrated acoustic data for measurement of opportunistic source received levels independent of the tag hydrophone. This data will be primarily used to verify and correct acoustic amplitude data collected by the tag, potentially influenced by flow noise. The distance between the tagged animal and the array deployment will be greater than 100 meters.

The arrays are comprised of HS-150 (Sonar Research and Development UK) ceramic elements that are connected to custom electronics for amplification and filtering. These elements are enclosed inside a 2 inch diameter oil-filled hose of 1 – 3 meter length. The hose is potted onto the end of a support cable that is a multi-conductor underwater cable with 0.5 inch diameter (type FM070901-3 from Falmat Inc.). All seven elements are attached to the end of a single underwater cable which greatly reduces the chance for entanglement of target animals. Under towing conditions, the cable extends aft of the tow vessel, with about 50-200 lbs. of tension (can be recovered by hand), depending on tow speed. When holding station the tow cable hangs vertically from the support vessel. When in survey mode, the towed array can remain in the water for several hours or longer. When in hanging (stationary) mode the array is typically kept in the water for about 10-30 minutes, and is rarely deployed for longer than 1 hour.

The risk of entanglement during towing is low owing to the extremely linear configuration of the array (directly aft of the tow vessel), and its streamlined profile. The array has less tension when operated in the hanging mode, but it is typically directly beneath the vessel, and again has a smooth, streamlined profile that will help to reduce the risk of entanglement with marine mammals. We would not for safety reasons (ours and the whales) deploy the array within a group of surface feeding humpbacks, for instance, or in any other situation where it seemed an entanglement risk was apparent. We recognize that entanglement can be a problem with a single line in whale feeding areas, and we will be vigilant to avoid using the array in high-risk settings. We plan to use towed arrays to collect sound data at all study sites. The collection of sound data in the presence of these animals is an essential component of our study.

Autonomous Acoustic Recorders
Broadband High-frequency Acoustic Recording Packages (HARPs) monitor the acoustic environment. HARPs are bottom-mounted instruments containing a release system, ballast weights, and flotation (Wiggins and Hildebrand 2007). The seafloor package is easily deployed and recovered due to its compact, self-contained design. The hydrophone sensor is tethered to the seafloor instrument via polypropylene line and buoyed 10 m off the seafloor by floats. HARPs record continuous acoustic data within the frequency range 10 Hz to 100 kHz. The HARP sensor included two transducers resulting in a high-sensitivity hydrophone highly capable at low and high frequencies. HARPs currently store 10 GB of acoustic data allowing continuous recording at 200 kHz sample rate for 300 days. The HARP may be duty-cycled (e.g. 20 min on, 10 min off) to provide longer recording durations. The HARPs will be serviced with new disks and batteries every 6-12 months.

We do not anticipate that HARP deployments will impact whale behavior. HARP deployments will not be conducted in the immediate vicinity of whales. These devices are deployed using an A-frame or crane from the deck of the research vessel. They are negatively buoyant and fall nearly directly to the seafloor beneath the point of release. They are for passive acoustic listening and produce no sound while in operation on the seafloor.

We have obtained appropriate permits when we have deployed HARPs in National Marine Sanctuaries (e.g. Channel Islands and Olympic Coast), and we will obtain permits for all future deployments in National Marine Sanctuaries. We are currently working from a Channel Islands National Marine Sanctuary vessel, in collaboration with CINMS staff, for HARP deployments in the Santa Barbara channel.

Supplemental Information

Status of Species: Please see attached file.

Lethal Take: Not Applicable

Anticipated Effects on Animals: Potential effects on individual animals will be short-lived disturbance, from reactions to vessel approach and from suction-cup attachment of tags. Reactions to approach and tagging vary by species and by individual. Some species show little or no reaction to vessel approach, while others appear to actively avoid the research vessel. Suction-cup tags would not be expected to alter the behavior of animals because many whales typically have remora (sucker fish) attached to their bodies. Some remoras are as large as or larger than the tags we deploy. Photographic-identification is now widely used with many cetacean species (Hammond 1986) and is widely accepted as having only small impacts. The primary impact to whales would be the possible disruption of feeding and other activities as a result of harassment incidental to the surveys and photographic identification efforts. We do not anticipate long-term impacts from our proposed activities.

Our research methods produce a minimal level of stress, pain and suffering to the animals. Biopsy sampling may cause mild and brief pain for some animals; however, there is no feasible alternative for reliably collecting tissue samples. The direct physical impact of a biopsy dart on a large whale is negligible. The dart penetrates only 2-4 cm into the whale and removes a tissue sample of less than 1 cc in volume (or 1 gram in weight) from an animal that may exceed 40,000 kilograms in weight. Darts are necessarily cleaned between biopsy contacts not only to reduce the chance of infection, but also to provide pure genetic samples. A number of studies have examined the reaction of whales to biopsy sampling similar to what we propose including humpback, blue, fin, right, gray, killer, sperm, bottlenose and minke whales (Weinrich et al. 1991; 1992, Gauthier and Sears 1999, Whitehead et al. 1990, Barrett-Lennard et al. 1996, Lambertsen et al. 1994; Hooker et al. 2001; La Fortuna et al. 2003) as well as bottlenose and other species of dolphins (Krützen et al. 2002). All of these have shown only moderate responses to the biopsy and then a resumption of normal activities. Weinrich et al. (1987) conclude that the behavioral reactions to biopsy sampling tend to be short lived and may have limited, if any, biological impact on the individual. Despite the immediate response to the biopsy dart, there was little significant difference in the whales overall behavior during the pre- and post-biopsy observation periods. More than ten thousand dolphins have now been biopsy darted (applicants' estimate) with one documented mortality (Bearzi 2000) and one undocumented case of serious injury when the biopsy dart entered the blowhole of a bow riding dolphin when darting from a large vessel (Bob Pitman pers. comm.).

The tagging proposed here using non-penetrating suction-cup attachment would have many of the same potential impacts as biopsy but without the potential for injury related to penetration of the skin. Tagging involves close approach and contact with either a pole or a projectile that hits the whale. Potential for injury from tagging has several components: 1) behavioral response from close approach, and 2) behavioral response from attachment, 3) injury from actual attachment. Tagging, especially with pole deployment generally involves closer approaches than biopsy. Since we generally use a pole of 3-4 m, pole deployment requires approaches to at least this range. This approach is fairly brief and reaction appears to be similar to that addressed above for biopsy with no evidence of changes in behavior other than in the few minutes following close approach.

Dive data collected to date (Oleson et al. 2007; Goldbogen et al. 2006) show an occasional atypical shallow dive of intermediate length immediately after tag deployment followed by a resumption of normal feeding or traveling dives within 5 minutes. The resumption of typical feeding and traveling behavior after deployment also indicate no adverse response by the whale to the presence of the tag. Many whales and dolphins including blue and humpback whales often live with remora (sucker fish) attached by suction to their body (Fertl and Landry 2002). The presence of a small object attached by suction therefore is not something that these animals do not experience normally.

Tag deployments may cause mild and brief discomfort or pain for some animals. Therefore, similar measures to mitigate possible stress to animals will be adhered to during tagging operations. The proposed research utilizes a technique to obtain continuous information on the sub-surface behavior of cetaceans by applying instruments that are attached with suction-cups. Alternate measures of attaching instruments to cetaceans require penetrating the skin for attachment, and in many cases (with smaller species), capturing animals. Both techniques are more likely to cause stress, pain or suffering than suction-cup tagging.

We do not expect any injury to skin of whales from suction-cup attachment other than perhaps the removal of some of the outer layers of sloughing skin. Whales slough skin on a regular basis and these pieces of skin can be found in the footprint of whales and have been used by a number of researchers as an alternate means of collecting skin samples. We have recovered skin from the suction cup of tags deployed on whales. We have never seen any injury on whales as a result of deployment of suction cup tags. Because the tags attach with a suction-cup, they are not expected to provide substantial drag, even on small cetaceans, since the cups slide off if substantial drag is placed on them.

Effects of Incidental Harassment

During past research activities, the reaction of cetaceans to incidental harassment through vessel approach has varied from no reaction to swimming towards, swimming away or diving. During small boat

operations cetaceans sometimes swim away or dive as they are being approached.

Measures to Minimize Effects to Listed Species:

Our research will be conducted with the least invasive technique as required to achieve the research objectives. We will also take a number of steps to keep disturbance at a minimum. To avoid any cumulative impact from our research in combination with the activities of other researchers we will coordinate our activities with other researchers to avoid unnecessary duplication. We maintain excellent working relationships with other researchers in the regions we will be working, most of whom are familiar with our research. There is therefore limited possibility of duplication of research effort.

Photo-identification:
We will keep our photographic approaches as short as possible by leaving groups after we have obtained suitable identification photographs of the whales in a group. The time devoted to collection of photographic data varies as a function of species, behavior and group size. For small delphinids, such as bottlenose dolphins, the average amount of time spent on this procedure is generally 20 minutes, with a maximum of 40 minutes. In the case of deep diving, short surface interval species, such as beaked whales, the average amount of time spent on photographic data collection is typically 5 minutes with a maximum of 10 minutes during longer surface intervals. Large whales can be adequately photographed on two approaches across two surface intervals, averaging approximately 10 minutes with a maximum of 20 minutes. Multiple approaches of the same groups of whales on a given day will be avoided if we are able to determine that we have already identified that particular group. We will suspend photographic identification efforts if our activities are resulting in the disruption of normal activities. We will avoid traveling in front of or blocking the intended path of groups of whales. When approaching cows with calves we will be particularly cautious and will avoid separating or coming between a cow and her calf.

Biopsy:

Mitigation measures include close observation of whale behavior, use of lowest possible projectile velocity, maintaining sharp dart tips and minimizing the number of close approaches to each animal. As described previously we will keep the dart tips clean between biopsy attempts to reduce chances of infection. Behavioral impacts of tagging and biopsy will be mitigated, when possible, by the following strategies: 1) the use of a free-floating dart for biopsy of large whales and mid-sized cetaceans; 2) the use of a pole for biopsy of small-cetaceans; 3) the use of small boats; 4) a limit of no more than three close approaches to, and time in pursuit of, an individual or a pod; and 5) the termination of an approach if an animal shows extreme avoidance or surface behaviors indicating extreme behavioral disturbance. Similar to photographic data, biopsy collection time varies as a function of species, behavior and group size. For small delphinids, the average amount of time spent on this procedure is 10 minutes, with a maximum of 20 minutes. In the case of deep diving, short surface interval species, such as beaked whales, the average amount of time spent on biopsy data collection is typically 5 minutes with a maximum of 10 minutes during longer surface intervals. In order to minimize the impacts/disturbances of individual animals, no more than three attempts for biopsy and tagging of a known individual will be made during a given year. Large whales can typically be biopsy sampled on the first approach, averaging approximately 4 minutes with a maximum of two surface intervals over the course of 20 minutes.

The use of free-floating darts and small vessels decrease the probability of eliciting an extreme response in a biopsied whale. Likewise, the use of a pole for small cetacean biopsy is thought to reduce the risk of injury or extreme behavioral response. The number of close approaches (less than 100 meters) to a single individual or pod will be limited to no more than three per day. If a whale reacts negatively to darting attempts (i.e. by turning away, diving or slapping flipper or fluke), sampling will be curtailed after the third unsuccessful attempt. Any given tag or biopsy attempt will be terminated if the pod or individual shows extreme behavioral response to the vessel approach. For this purpose, an extreme behavioral response is defined as avoidance of the vessel by rapid surface swimming (greater than 10 km/hr), displacement from a feeding site, explosive breaching, or evidence of social disruption.

Fecal Sampling
Fecal samples will be collected when possible, but it is not anticipated that this sampling will result in additional takes, as the sampling will be done as part of photo-identification, biopsy and tagging studies, and should not require additional close approach.

Tagging:

For tagging we will primarily utilize a small boat for close approach to minimize disturbance of the animals. When animals are bow riding at the large vessel, we will conduct tag attachment from the large vessel. We will use a non-invasive attachment technique based on suction cups, which is suitable for the duration of tag attachment needed for this work. Any given tag or biopsy attempt will be terminated if the pod or individual shows extreme behavioral response to the vessel approach. Tagging attempts will be limited to no more than three close approaches per day on a given individual or group. The time required for tagging approaches again varies as a function of species, behavior and group size. For small delphinids, such as bottlenose dolphins, who will be tagged while bowriding, the average amount of time spent on this procedure is generally 10 minutes, with a maximum of 30 minutes. In the case of deep diving, short surface interval species, such as beaked whales, the average amount of close approach time spans approximately 10 minutes with a maximum 15 minutes during periods with longer surface intervals. Typically, the maximum of three tagging attempts on large whale groups will span an average of 30 minutes with a maximum of 45 minutes. Known individuals would only be tagged once during the life of the permit, as acoustic calling samples and potential behavioral effects from anthropogenic sources may vary between individuals, necessitating a sample that includes data from multiple animals. Given the challenges associated with successful tag deployment and recovery, we would make all attempts to attach the

bioacoustics tag to a different individual across the duration of the permit.

MONITORING

During the time we are in the field, we will monitor the animals' behavior to look for short-term effects. As mentioned above, we will terminate our activity (photo-id, biopsy, or tagging) if the pod or individual shows overt behavioral disturbance. No long-term adverse effects on the stocks listed in this application are anticipated and no effects on reproductive rates or on continued survival in the wild related to these activities have been identified. Over the period where research has been conducted no significant, persistent response (i.e., increased avoidance or evasive behavior) in response to vessels or aircraft by any population of animals under study has been documented.

Resources Needed to Accomplish Objectives: Appendix II in the attached supplemental file includes a list of current and pending proposals for our research group that are related to this work. Ample funds are available to conduct this work, and we anticipate that we will continue to seek and receive support from our current sponsors.

Disposition of Tissues: The resulting skin/blubber biopsy samples, sloughed skin or fecal samples collected from the water surface or water column, or skin samples collected off tag suction cups, will either be frozen or stored in compliance with the current best practices as recommended by Southwest Fisheries Science Center. Samples will be provided to one or more of our collaborators at SWFSC including Dave Weller, Nick Kellar and Gabriela Serra-Valente (see biopsy method section above for additional details). Samples collected opportunistically from non-target species are provided to the genetics collection curator, Gabriela Serra-Valente, with no restrictions on use for current or planned projects by SWFSC scientists.

Public Availability of Product/Publications: The data collected as a result of the proposed work will be compiled, analyzed and written up in contract reports and peer-reviewed publications. Much of this work will become components of study for graduate degrees. Results of the research will be regularly presented at scientific conferences and published in peer-reviewed scientific journals. All published work conducted under the authority of a NMFS permit will be submitted to the Office of Protected Resources.

Location/Take Information

Location

Research Area: Atlantic Ocean **States:** FL,LA,MS,TX **Stream Name:** Gulf of Mexico
Sale in Oregon of species taken: None
Location Description: Areas include: (A) The shelf break region south of Louisiana, (B) The De Soto/Mississippi Canyon Area, (C) The Dry Tortugas, and (D) Bryde's whale habitat in the north-eastern Gulf of Mexico.

Take Information

Line	Ver	Species	Listing Unit/Stock	Production /Origin	Life Stage	Sex	Expected Take	Takes Per Animal	Take Action	Observe /Collect Method	Procedure	Transport Record	Begin Date	End Date
1		Dolphin, Atlantic spotted	Northern Gulf of Mexico Stock	Wild	All	Male and Female	1925	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
2		Dolphin, Atlantic spotted	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

3		Dolphin, Atlantic spotted	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
4		Dolphin, bottlenose	Northern Gulf of Mexico Continental Shelf Stock	Wild	All	Male and Female	875	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
		Details: can be from any GoM stock												
5		Dolphin, bottlenose	Northern Gulf of Mexico Continental Shelf Stock	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
		Details: can be from any GoM stock												
6		Dolphin, bottlenose	Northern Gulf of Mexico Continental Shelf Stock	Wild	Adult	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: can be from any GoM stock; one suction-cup tag per animal at a time												
7		Dolphin, clymene	Northern Gulf of Mexico Stock	Wild	All	Male and Female	425	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
8		Dolphin, clymene	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

9		Dolphin, clymene	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
10		Dolphin, Fraser's	Northern Gulf of Mexico Stock	Wild	All	Male and Female	35	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
11		Dolphin, Fraser's	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
12		Dolphin, Fraser's	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
13		Dolphin, pantropical spotted	Northern Gulf of Mexico Stock	Wild	All	Male and Female	1925	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
14		Dolphin, pantropical spotted	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
15		Dolphin, pantropical spotted	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and	N/A	9/11/2013	1/16/2018

										blubber biopsy; Tracking				
	Details: one suction-cup tag per animal at a time													
16		Dolphin, Risso's	Northern Gulf of Mexico Stock	Wild	All	Male and Female	425	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
17		Dolphin, Risso's	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
18		Dolphin, Risso's	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time													
19		Dolphin, rough-toothed	Northern Gulf of Mexico Stock	Wild	All	Male and Female	75	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
20		Dolphin, rough-toothed	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	20	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
21		Dolphin, rough-toothed	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time													

22		Dolphin, spinner	Northern Gulf of Mexico Stock	Wild	All	Male and Female	425	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
23		Dolphin, spinner	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
24		Dolphin, spinner	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
25		Dolphin, striped	Northern Gulf of Mexico Stock	Wild	All	Male and Female	930	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
26		Dolphin, striped	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
27		Dolphin, striped	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	20	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
28		Whale, Blainville's beaked	Northern Gulf of Mexico Stock	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018

29		Whale, Blainville's beaked	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
30		Whale, Blainville's beaked	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
31		Whale, Bryde's	Northern Gulf of Mexico Stock	Wild	All	Male and Female	20	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
32		Whale, Bryde's	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
33		Whale, Bryde's	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
34		Whale, Cuvier's beaked	Northern Gulf of Mexico Stock	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
35		Whale, Cuvier's beaked	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

36		Whale, Cuvier's beaked	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
37		Whale, dwarf sperm	Northern Gulf of Mexico Stock	Wild	All	Male and Female	15	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
38		Whale, dwarf sperm	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
39		Whale, dwarf sperm	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
40		Whale, false killer	Northern Gulf of Mexico Stock	Wild	All	Male and Female	20	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
41		Whale, false killer	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
42		Whale, false killer	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and	N/A	9/11/2013	1/16/2018

											blubber biopsy; Tracking			
	Details: one suction-cup tag per animal at a time													
43		Whale, Gervais' beaked	Northern Gulf of Mexico Stock	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
44		Whale, Gervais' beaked	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
45		Whale, Gervais' beaked	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time													
46		Whale, melon-headed	Northern Gulf of Mexico	Wild	All	Male and Female	70	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
47		Whale, melon-headed	Northern Gulf of Mexico	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
48		Whale, melon-headed	Northern Gulf of Mexico	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time													

49		Whale, pilot, short-finned	Northern Gulf of Mexico Stock	Wild	All	Male and Female	65	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
50		Whale, pilot, short-finned	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
51		Whale, pilot, short-finned	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
52		Whale, pygmy killer	Northern Gulf of Mexico Stock	Wild	All	Male and Female	20	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
53		Whale, pygmy killer	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
54		Whale, pygmy killer	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
55		Whale, pygmy sperm	Northern Gulf of Mexico Stock	Wild	All	Male and Female	15	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018

56		Whale, pygmy sperm	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
57		Whale, pygmy sperm	Northern Gulf of Mexico Stock	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
58		Whale, sperm	Northern Gulf of Mexico Stock (NMFS Endangered)	Wild	All	Male and Female	90	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
59		Whale, sperm	Northern Gulf of Mexico Stock (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
60		Whale, sperm	Northern Gulf of Mexico Stock (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
61		Whale, unidentified baleen	NA	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											

62		Whale, unidentified baleen	NA	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
63		Whale, unidentified baleen	NA	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
64		Whale, unidentified beaked	NA	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
65		Whale, unidentified beaked	NA	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
66		Whale, unidentified beaked	NA	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time													

Location

Research Area: Pacific Ocean **States:** AK,AS,CA,GU,HI,MP,OR,WA **Stream Name:** Northeastern Pacific Ocean
Sale in Oregon of species taken: None
Location Description: Includes: the U.S. West Coast, North Pacific coast of Alaska, Hawaii, Pearl and Hermes reef, Wake Island, Palmyra Atoll, American Samoa, Guam, and Saipan.

Take Information

Line	Ver	Species	Listing Unit/Stock	Production /Origin	Life Stage	Sex	Expected Take	Takes Per Animal	Take Action	Observe /Collect Method	Procedure	Transport Record	Begin Date	End Date

1		Dolphin, bottlenose	California Coastal Stock	Wild	All	Male and Female	350	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
2		Dolphin, bottlenose	California Coastal Stock	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
3		Dolphin, bottlenose	California Coastal Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, skin biopsy; Tracking	N/A	9/11/2013	1/16/2018
4		Dolphin, bottlenose	California/Oregon/Washington Offshore Stock	Wild	All	Male and Female	850	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
5		Dolphin, bottlenose	California/Oregon/Washington Offshore Stock	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

6		Dolphin, bottlenose	California/Oregon/Washington Offshore Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
7		Dolphin, bottlenose	Range-wide	Wild	All	Male and Female	850	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
8		Dolphin, bottlenose	Range-wide	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
9		Dolphin, bottlenose	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											

10		Dolphin, common, long-beaked	California Stock	Wild	All	Male and Female	1850	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
11		Dolphin, common, long-beaked	California Stock	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
12		Dolphin, common, long-beaked	California Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
13		Dolphin, common, short-beaked	California/Oregon/Washington Stock	Wild	All	Male and Female	1850	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
14		Dolphin, common, short-beaked	California/Oregon/Washington Stock	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

15		Dolphin, common, short-beaked	California/Oregon/Washington Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
16		Dolphin, Fraser's	Hawaii Stock	Wild	All	Male and Female	930	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
17		Dolphin, Fraser's	Hawaii Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
18		Dolphin, Fraser's	Hawaii Stock	Wild	Adult/ Juvenile	Male and Female	20	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											

19		Dolphin, northern right whale	California/Oregon/Washington Stock	Wild	All	Male and Female	850	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
20		Dolphin, northern right whale	California/Oregon/Washington Stock	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
21		Dolphin, northern right whale	California/Oregon/Washington Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
22		Dolphin, Pacific white-sided	California/Oregon/Washington - Northern and Southern Stocks	Wild	All	Male and Female	1850	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
23		Dolphin, Pacific white-sided	California/Oregon/Washington - Northern and Southern Stocks	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

24		Dolphin, Pacific white-sided	California/Oregon/Washington - Northern and Southern Stocks	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
25		Dolphin, pantropical spotted	Range-wide	Wild	All	Male and Female	925	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
26		Dolphin, pantropical spotted	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
27		Dolphin, pantropical spotted	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											

28		Dolphin, Risso's	Range-wide	Wild	All	Male and Female	850	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
29		Dolphin, Risso's	Range-wide	Wild	Adult/ Juvenile	Male and Female	100	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
30		Dolphin, Risso's	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
31		Dolphin, rough-toothed	Range-wide	Wild	All	Male and Female	930	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
32		Dolphin, rough-toothed	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

33		Dolphin, rough-toothed	Range-wide	Wild	Adult/ Juvenile	Male and Female	20	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
34		Dolphin, spinner	Range-wide	Wild	All	Male and Female	125	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
35		Dolphin, spinner	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
36		Dolphin, spinner	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time													

37		Dolphin, striped	Range-wide	Wild	All	Male and Female	930	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
38		Dolphin, striped	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
39		Dolphin, striped	Range-wide	Wild	Adult/ Juvenile	Male and Female	20	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
40		Porpoise, Dall's	Range-wide	Wild	All	Male and Female	925	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
41		Porpoise, Dall's	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

42		Porpoise, Dall's	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
43		Whale, Baird's beaked	Range-wide	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
44		Whale, Baird's beaked	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
45		Whale, Baird's beaked	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018

46		Whale, Blainville's beaked	Range-wide	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
47		Whale, Blainville's beaked	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
48		Whale, Blainville's beaked	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
49		Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	Wild	All	Male and Female	100	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
		Details: May-Nov.												
50		Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

		Details: May-Nov.											
51		Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: May-Nov.; one suction-cup tag per animal at a time											
52		Whale, Bryde's	Range-wide	Wild	All	Male and Female	15	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
53		Whale, Bryde's	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
54		Whale, Bryde's	Range-wide	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											

55		Whale, Cuvier's beaked	Range-wide	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
56		Whale, Cuvier's beaked	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
57		Whale, Cuvier's beaked	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
58		Whale, dwarf sperm	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
59		Whale, dwarf sperm	Range-wide	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id;	N/A	9/11/2013	1/16/2018

										Sample, fecal ; Sample, skin and blubber biopsy; Tracking			
	Details: one suction-cup tag per animal at a time												
60		Whale, dwarf sperm	Range-wide	Wild	All	Male and Female	15	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
61		Whale, false killer	Hawaii Insular (NMFS Endangered)	Wild	All	Male and Female	10	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
62		Whale, false killer	Range-wide	Wild	All	Male and Female	20	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
	Details: Except endangered Hawaiian insular stock												
63		Whale, false killer	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
	Details: Except endangered Hawaiian insular stock												

64		Whale, false killer	Range-wide	Wild	Adult/ Juvenile	Male and Female	5	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: Except endangered Hawaiian insular stock; one suction-cup tag per animal at a time											
65		Whale, fin	Range-wide (NMFS Endangered)	Wild	All	Male and Female	100	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
66		Whale, fin	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
67		Whale, fin	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											

68		Whale, gray	Eastern North Pacific	Wild	All	Male and Female	125	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
		Details: Dec.-May												
69		Whale, gray	Eastern North Pacific	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
		Details: Dec.-May												
70		Whale, gray	Eastern North Pacific	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: Dec.-May; one suction-cup tag per animal at a time												
71		Whale, humpback	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018

		Details: May-Nov.; one suction-cup tag per animal at a time											
72		Whale, humpback	Range-wide (NMFS Endangered)	Wild	All	Male and Female	100	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
		Details: May-Nov.											
73		Whale, humpback	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
		Details: May-Nov.											
74		Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	Wild	All	Male and Female	5	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
75		Whale, killer	Range-wide	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
		Details: Except endangered Southern Resident stock											
76		Whale, killer	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample,	N/A	9/11/2013	1/16/2018

											skin and blubber biopsy			
	Details: Except endangered Southern Resident stock													
77		Whale, killer	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: Except endangered Southern Resident stock; one suction-cup tag per animal at a time													
78		Whale, Longman's beaked	Hawaiian Stock	Wild	All	Male and Female	30	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
79		Whale, Longman's beaked	Hawaiian Stock	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
80		Whale, Longman's beaked	Hawaiian Stock	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018

		Details: one suction-cup tag per animal at a time												
81		Whale, melon-headed	Hawaiian Stock	Wild	All	Male and Female	125	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
82		Whale, melon-headed	Hawaiian Stock	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
83		Whale, melon-headed	Hawaiian Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
84		Whale, minke	Range-wide	Wild	All	Male and Female	40	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
85		Whale, minke	Range-wide	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample,	N/A	9/11/2013	1/16/2018

										skin and blubber biopsy			
86		Whale, minke	Range-wide	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
87		Whale, pilot, short-finned	Range-wide	Wild	All	Male and Female	65	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
88		Whale, pilot, short-finned	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
89		Whale, pilot, short-finned	Range-wide	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												

90		Whale, pygmy killer	Hawaiian Stock	Wild	All	Male and Female	65	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
91		Whale, pygmy killer	Hawaiian Stock	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
92		Whale, pygmy killer	Hawaiian Stock	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
93		Whale, pygmy sperm	Range-wide	Wild	All	Male and Female	15	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
94		Whale, pygmy sperm	Range-wide	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018

95		Whale, pygmy sperm	Range-wide	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time											
96		Whale, right, North Pacific	Eastern North Pacific Stock (NMFS Endangered)	Wild	All	Male and Female	3	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
		Details: May-Dec.											
97		Whale, right, North Pacific	Eastern North Pacific Stock (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	2	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
		Details: May-Dec.											
98		Whale, sei	Range-wide (NMFS Endangered)	Wild	All	Male and Female	15	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018

99		Whale, sei	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
100		Whale, sei	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	10	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
		Details: one suction-cup tag per animal at a time												
101		Whale, sperm	Range-wide (NMFS Endangered)	Wild	Adult	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
102		Whale, sperm	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
103		Whale, sperm	Range-wide (NMFS Endangered)	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id;	N/A	9/11/2013	1/16/2018

										Sample, fecal ; Sample, skin biopsy; Tracking			
	Details: one suction-cup tag per animal at a time												
104		Whale, unidentified baleen	NA	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018
105		Whale, unidentified baleen	NA	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
106		Whale, unidentified baleen	NA	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time												
107		Whale, unidentified beaked	NA	Wild	All	Male and Female	25	1	Harass	Survey, vessel	Acoustic, passive recording; Count/survey; Incidental harassment; Observations, behavioral; Photo-id; Sample, fecal	N/A	9/11/2013	1/16/2018

108		Whale, unidentified beaked	NA	Wild	Adult/ Juvenile	Male and Female	50	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	N/A	9/11/2013	1/16/2018
109		Whale, unidentified beaked	NA	Wild	Adult/ Juvenile	Male and Female	25	1	Harass/Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	N/A	9/11/2013	1/16/2018
	Details: one suction-cup tag per animal at a time												

NEPA Checklist

1) If your activities will involve equipment (e.g., scientific instruments) or techniques that are new, untested,or otherwise have unknown or uncertain impacts on the biological or physical environment , please discuss the degree to which they are likely to be adopted by others for similar activities or applied more broadly.

The research activities proposed do not include any new, innovative, controversial or experimental equipment or techniques. All of the activities proposed in this permit application have been conducted for at least 10 years and have become the established methods for collecting cetacean data in the field. The research techniques are already in use by other researchers around the world, including researchers associated with government research labs, universities, and non-profit groups.

2) If your activities involve collecting, handling, or transporting potentially infectious agents or pathogens (e.g., biological specimens such as live animals or blood), or using or transporting hazardous substances (e.g., toxic chemicals), provide a description of the protocols you will use to ensure public health and human safety are not adversely affected, such as by spread of zoonotic diseases or contamination of food or water supplies.

Scientists involved in handling tissue will wear sterilized gloves to avoid touching the blubber and/or skin samples and all samples will be stored in sterilized and sealed vials.

3) Describe the physical characteristics of your project location, including whether you will be working in or near unique geographic areas such as state or National Marine Sanctuaries, Marine Protected Areas, Parks or Wilderness Areas, Wildlife Refuges, Wild and Scenic Rivers, designated Critical Habitat for endangered or threatened species, Essential Fish Habitat, etc. Discuss how your activities could impact the physical environment, such as by direct alteration of substrate during use of bottom trawls, setting nets, anchoring vessels or buoys, erecting blinds or other structures, or ingress and egress of researchers, and measures you will take to minimize these impacts.

We will conduct this research in the Channel Islands National Marine Sanctuary, Olympic Coast National Marine Sanctuary, the Monterey Bay, Cordell Bank, and Farallones National Marine Sanctuaries, the Hawaiian Islands Humpback Whale National Marine Sanctuary, the Papah?naumoku?kea Marine National Monument, Fagatele National Marine Sanctuary, and the Flower Garden Banks National Marine Sanctuary. We will obtain a permit for work from each regional sanctuary office and will work in collaboration with sanctuary staff. We will not conduct this study in the Hawaiian Monk Seal critical habitat, Southern Resident Killer whale critical habitat, or North Pacific Right whale critical habitat. Our study areas do include leatherback critical habitat areas off the U.S. west coast; however, during the last five years while working in this region, we have successfully identified and avoided any non-targeted endangered species through diligent visual monitoring in areas of important habitat, and good communication between small and large vessels onsite. Thus, we anticipate that we will be able to avoid leatherback turtles, maintaining regionally established viewing guidelines.

4) Briefly describe important scientific, cultural, or historic resources (e.g., archeological resources, animals used for subsistence, sites listed in or eligible for listing in the National Register of Historic Places) in your project area and discuss measures you will take to ensure your work does not cause loss or destruction of such resources. If your activity will target marine mammals in Alaska or Washington, discuss measures you will take to ensure your project does not adversely affect the availability (e.g., distribution, abundance) or suitability (e.g., food safety) of these animals for subsistence uses.

These activities will not cause loss or destruction of significant scientific, cultural, or historic resources.

5) Discuss whether your project involves activities known or suspected of introducing or spreading invasive species, intentionally or not, (e.g., transporting animals or tissues, discharging ballast water, use of equipment at multiple sites). Describe measures you would take to prevent the possible introduction or spread of non-indigenous or invasive species, including plants, animals, microbes, or other biological agents.

The above safeguards detailed for question #2 will be in place to avoid any potential spread of zoonotic diseases or contamination of food or water supplies. No laws for environmental protection will be violated in the course of this research. During our large scale research surveys, NOAA and SIO vessels conform to the requirements of 33 CFR 151, the Federal Water Pollution Control Act, IMO ballast water guidelines and MOC Environmental Guideline ENV 09. Efforts are made to exchange ballast no less than 200 nautical miles from shore, in waters greater than 2000 meters deep and a minimum salinity of 30 parts per thousand to minimize the risk of introducing harmful pollutants and/or potentially invasive species to new areas. Research equipment, such as hydrophone arrays or passive acoustic recorders, are designed and built specifically for each region where our research is conducted; such research tools are stored and maintained at nearby facilities for redeployment on future cruises. Thus, we do not move equipment between sites, thereby reducing the potential for the spread of invasive or non-indigenous species.

Project Contacts

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Name	Role(s)
Simone Bauman-Pickering	Co-Investigator
Gregory Campbell	Co-Investigator
Amanda Debich	Co-Investigator
Kaitlin Frasier	Co-Investigator
John Hurwitz	Co-Investigator
Josh Jones	Co-Investigator
Jason Larese	Co-Investigator
Anne Simonis	Co-Investigator
Anna Sirovic	Co-Investigator
Elizabeth Vu	Co-Investigator
Sean Wiggins	Co-Investigator

Attachments

Contact - Amanda Debich: C16837T517312 Debich CV.docx (Added Apr 8, 2013)

Contact - Anna Sirovic: C16842T517312 Sirovic CV.docx (Added Apr 8, 2013)
Contact - Anne Simonis: C16841T517312 Simonis CV.docx (Added Apr 8, 2013)
Contact - Elizabeth Vu: C16843T517312 Vu CV.docx (Added Apr 8, 2013)
Contact - Gregory Campbell: C9122T517312 Campbell CV.docx (Added Apr 8, 2013)
Contact - Jason Larese: C14241T517312 Larese CV.docx (Added Apr 8, 2013)
Contact - Jason Larese: C14241T5JPL fieldwork resume.doc (Added Jun 11, 2010)
Contact - John Hildebrand: C9120T517312 Hildebrand CV.docx (Added Apr 8, 2013)
Contact - John Hurwitz: C16839T517312 Hurwitz CV.docx (Added Apr 8, 2013)
Contact - Josh Jones: C16840T517312 Jones CV.docx (Added Apr 8, 2013)
Contact - Kaitlin Frasier: C16838T517312 Frasier CV.docx (Added Apr 8, 2013)
Contact - Sean Wiggins: C9123T517312 Wiggins CV.docx (Added Apr 8, 2013)
Contact - Simone Bauman-Pickering: C16836T517312 Bauman-Pickering CV.docx (Added Apr 8, 2013)
Project Description - P17312T117312 Past Research Summary 2008-2013.docx (Added Apr 4, 2013)
Project Description - P17312T117312 Status of Affected Stocks.docx (Added Apr 4, 2013)
Project Description - P17312T117312 supplemental info.docx (Added Apr 9, 2013)

Status

Application Status: Application Complete
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Last Date Archived: September 18, 2013

- **MMPA/ESA Research/Enhancement permit**

  Current Status: Issued **Status Date:** September 11, 2013
  Section 7 Consultation: Formal Consultation
  NEPA Analysis: Categorical Exclusion
  Expire Date: September 13, 2018
  Analyst Information:

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Modification Requests

Reports